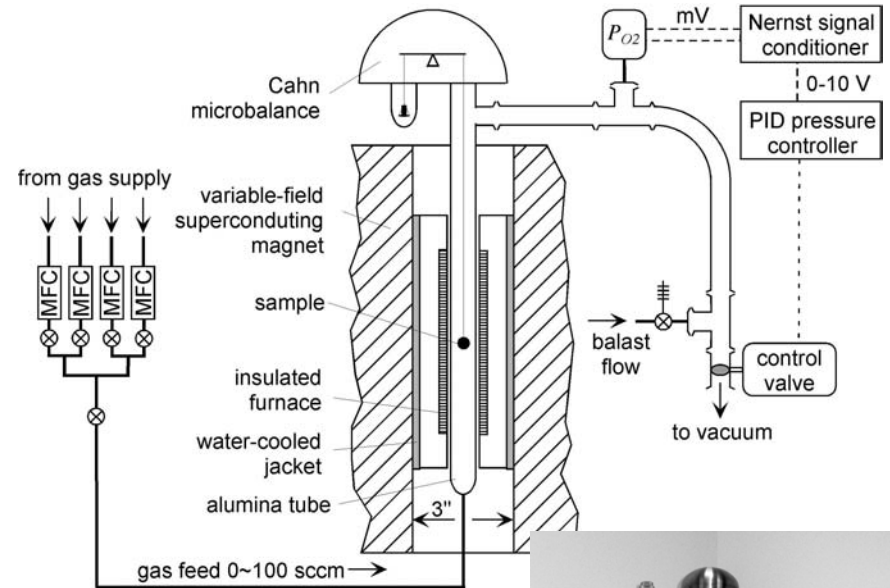


Electrochemical Ceramics - Understanding the Gap between Localized and Collective Viewpoints of Electronic Structure

Stuart B, Adler, Univ. Washington, DMR-0222002

Solid Oxide Fuel Cells and other related devices utilize *electrochemical ceramics*, which conduct electrons and ions at high temperature. The properties of these materials depend strongly on their electronic structure, which falls somewhere in-between that of a semiconductor or metal. We are currently constructing a high-temperature, controlled atmosphere faraday balance, which will allow us to probe the electronic structure via magnetic properties. This instrument (the only one of it's type), is also of general interest to condensed matter physics and geophysics, as it allows sensitive magnetic measurements in extreme environments.



Faraday balance for studies of magnetism in mixed-conducting ceramics. By measuring the magnetic moment, it is possible to tell how “local” or “distributed” the electrons become at high temperature or reduced P_{O_2} .

